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# *Marinogammarus obtusatus* (Amphipoda), a new intermediate host of the nematode *Pseudoterranova decipiens*

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## Abstract

The amphipod *Marinogammarus obtusatus* (Dahl) is recorded as a new intermediate host of stage III larvae of the anisakid *Pseudoterranova decipiens*. Results of studying the same larva under the light and scanning microscopes established that helminths mounted in temporary glycerine preparations for not more than 3 h. can subsequently be used, after special treatment, for observation under the scanning microscope.

During a study of the parasites of gammarids from the region of Cape Kindo (the area of the White Sea Biological Station (BBS), Moscow State University) one larva of a nematode of the family Anisakidae, Pseudoterranova (= Phocanema, Terranova, Porrocaecum) decipiens, was found. The same larvae were reported by us in 1965 from the polychaete Lepidonotus squamatus found on the rhizoid laminaria from Eremeevsk sill opposite to the BBS (3), and also in 1976 in the amphipod Caprella septentrionalis, collected in the Velikay Salma Strait (2).

In September 1984, 134 crustaceans were studied. In the haemocoel of one of the females a stage III larva (based on its morphology) was found. For identification of the larva we used figures and specimens of larvae of P. decipiens found by us in invertebrates (polychaetes, amphipods), as well as in fish (cod).

It should be noted that only 60 km south of the BBS, in the region of Cape Kartesh, V. G. Kulachkova and S. V. Bityukova (4) did not find nematodes of the specified genus in a study of the parasite fauna of six species of littoral gammarids.

Because P. decipiens larva is noted in gammarids for the first time, we consider that it is necessary to provide a description and figures of it.

The larva is a whitish-cream colour, well-shaped, with smooth cuticle. The head end carries three poorly developed lips and a fairly strong boring tooth (fig. 1, Б). The tail is elongate-conical (fig. 1, B). The length of the larva is 4.103 mm, with a maximum width of 0.198 mm, width at the level of the head is 0.050 mm, in the region of the ventriculus 0.193 mm, and at the level of the anus 0.084 mm. The esophagus, the length and width of which are 0.737 mm and 0.066 mm, leads into a cylindrical ventriculus of length 0.319 mm

and width 0.108 mm. A fairly large, triangular-shaped intestinal caecum reaches approximately to the mid-length of the ventriculus on its ventral side (fig. 1, A); its length is 0.162 mm, and its width is 0.051 mm. The colour of the intestinal tract, including the intestinal caecum, is an olive-green shade*. A well-expressed nerve ring lies at a distance of 0.223 mm from the anterior end of the body. The anus occurs at a distance of 0.124 mm from the posterior end of the body. Rectal glands are present. Approximately at the middle of the body it is possible to make out with some difficulty the genital primordium, which consists of only 15 cells and is 1.969 mm from the posterior end of the body and 2.134 mm from the anterior end of the body.

Under high magnification (10 X 40) it is possible to observe some transverse striations on the cuticle at intervals of 0.0009 mm in the region of the anterior end and 0.0014 mm near the posterior end of the body.

Because we had available only three larvae of this species from invertebrates, we studied one of them in greater detail by comparison with the two others that were investigated by us earlier. In this case, apart from the commonly used method for clearing parasites in glycerine-water solution, as quickly as possible (to avoid flattening the specimen under the cover slip) we measured and drew the larva in order to use it for work with the scanning microscope. The larva was removed from under the cover slip, placed in a vial with tap water, then rinsed in several changes of distilled water, after which it was transferred to 70% ethyl alcohol (for approximately 12 h). Subsequently, we followed the ususal procedure of dehydration through a series of alcohols and

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*We have also found the larva of P. decipiens with the same colour intestinal tract in fish.

then we followed the procedures described by M. A. Valovaya (1). As a result, we obtained fairly satisfactory pictures. On the basis of this we think that we can recommend that helminth specimens from glycerine may be used for study with the scanning microscope*. However, we have to emphasize that the specimen should not be in glycerine more than 3 h, otherwise it will become flattened and deformed.

In addition to the description of the larva based on its study under the light microscope, we will provide some further details of the morphology of the larva that we obtained from the scanning microscope.

The head end is not clearly separated from the rest of the body. The transition between the head and the body of the worm can be detected by the appearance of transverse striations (fig. 2, A). On the head the cuticle is slightly wrinkled. The mouth is fully opened and has a triangular shape, which is characteristic for anisakid stage III larvae (5). A robust conical tooth protrudes on the ventral side adjacent to the mouth opening. In figure 2, A, the right lateral lip is clearly visible and the left lateral lip is hidden by the tooth (only a small part of the lip is visible). Opposite to the boring tooth, on the other side of the mouth opening, is the dorsal lip. A submedian papilla, characteristic for the stage IV larva and the adult nematode, is not yet clearly expressed in this larva, although its location can be judged from the elevation of the cuticle. Unfortunately, on this figure with such foreshortening, the excretory pore, which is located on the ventral side, is not visible because it was covered by the boring tooth and the lateroventral lips.

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*The present work with the scanning microscope was done by M. A. Valovaya. We take this opportunity to thank her sincerely.

In the scanning photograph of the larvae of this species collected from fish, the position of the excretory pore is clearly visible (5, fig. 9). The transverse striations on the anterior and posterior ends of the body are clearly visible under a magnification of 3000-5000 times (fig. 2, В, Г). Evidently, the transverse rings are ornamented with shallow, fine longitudinal striations. The anal opening is in the form of a fairly long and narrow transverse slit, bordered by a distinctive raised lip over its entire length (fig. 2, Б). The tail is conical. The ventral side of the posterior end of the body in the region of the anus is inflated, which is clearly seen in fig. 2, Д.

It should be added that it is difficult, while photographing a fixed piece and with the position of the stub virtually unchangeable, to obtain a large sweep area for the electron beam. Consequently, it is sometimes difficult to obtain a good foreshortened view. This is why figs. 1, В and 2, Д, based on the same part of the larva, appear different.

Thus, a crustacean of the order Amphipoda and the family Gammaridae, Marinogammarus obtusatus (Dahl.), is recorded by us as a new intermediate host of the anisakid nematode P. decipiens. This finding permits us to enlarge the list of intermediate hosts developed by us earlier for this parasite.

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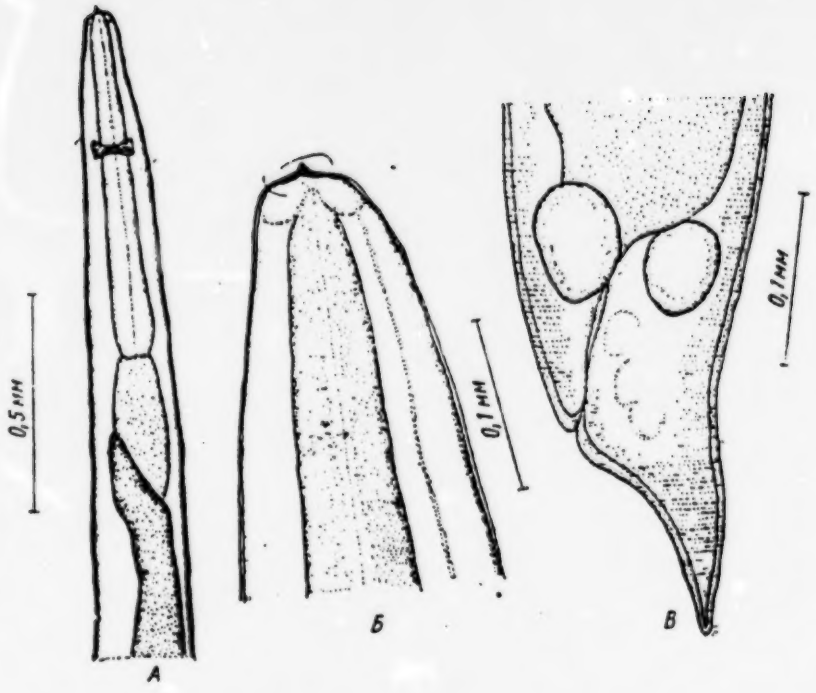


Fig. 1. Larva of Pseudoterranova decipiens from the haemocoel of Marinogammarus obtusatus. А - anterior end of body; Б - head end of body; В - tail end

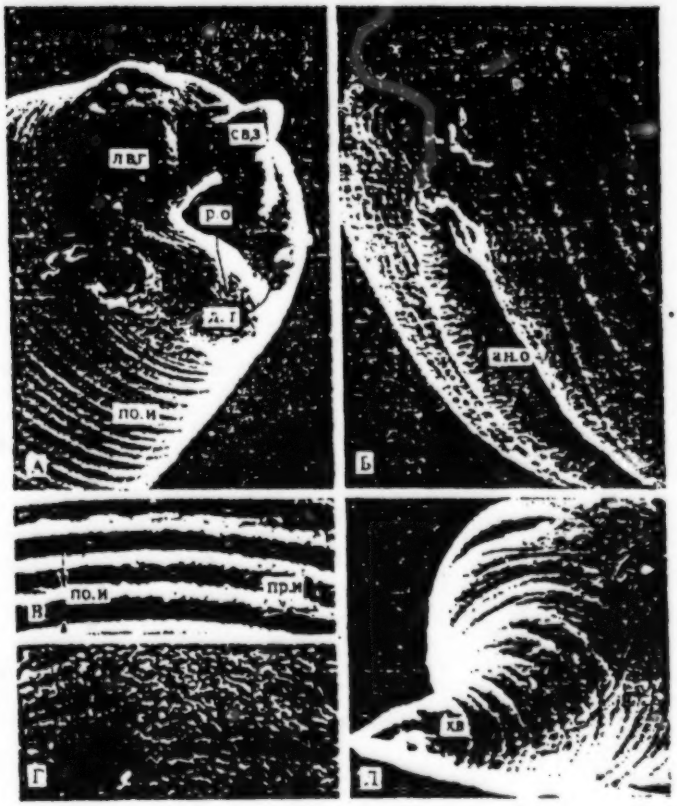


Fig. 2. Larva of Pseudoterranova decipiens, studied by scanning microscope. А - head end (1500X); Б - region of the posterior end of the body with the anal opening (3000X); В - striations of the cuticle in the anterior part of the body (5000X); Г - striations of the cuticle in the posterior part of the body (3000X); Д - tail end (1000X):

АН.О - anal opening; Д.Г. - dorsal lip; ЛВ.Г. - lateroventral lip; ПО.И. - transverse striation; ПР.И. - longitudinal striation; Р.О. - mouth opening; СВ.З. - boring tooth; ХВ. - tail